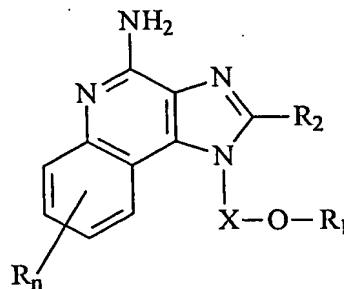


WHAT IS CLAIMED IS:

1. A compound of the formula (I):

5



(I)

10

wherein: X is -CHR₅-, -CHR₅-alkyl-, or -CHR₅-alkenyl-;

R₁ is selected from the group consisting of:

- R₄-CR₃-Z-R₆-alkyl;
- R₄-CR₃-Z-R₆-alkenyl;
- R₄-CR₃-Z-R₆-aryl;
- R₄-CR₃-Z-R₆-heteroaryl;
- R₄-CR₃-Z-R₆-heterocyclyl;
- R₄-CR₃-Z-H;
- R₄-NR₇-CR₃-R₆-alkyl;
- R₄-NR₇-CR₃-R₆-alkenyl;
- R₄-NR₇-CR₃-R₆-aryl;
- R₄-NR₇-CR₃-R₆-heteroaryl;
- R₄-NR₇-CR₃-R₆-heterocyclyl; and
- R₄-NR₇-CR₃-R₈;

15

each Z is independently -NR₅-, -O-, or -S-;

R₂ is selected from the group consisting of:

- hydrogen;
- alkyl;
- alkenyl;

20

25

- aryl;
- heteroaryl;
- heterocycl;
- alkyl-Y-alkyl;
- 5 -alkyl-Y- alkenyl;
- alkyl-Y-aryl; and
- alkyl or alkenyl substituted by one or more substituents selected from the group consisting of:
 - OH;
 - 10 -halogen;
 - N(R₅)₂;
 - CO-N(R₅)₂;
 - CO-C₁₋₁₀ alkyl;
 - CO-O-C₁₋₁₀ alkyl;
- 15 -N₃;
- aryl;
- heteroaryl;
- heterocycl;
- CO-aryl; and
- 20 -CO-heteroaryl;

each R₃ is =O or =S;

each R₄ is independently alkyl or alkenyl, which may be interrupted by one or more -O- groups;

each R₅ is independently H or C₁₋₁₀ alkyl;

25 R₆ is a bond, alkyl, or alkenyl, which may be interrupted by one or more -O- groups;

R₇ is H, C₁₋₁₀ alkyl, or arylalkyl; or R₄ and R₇ can join together to form a ring;

R₈ is H or C₁₋₁₀ alkyl; or R₇ and R₈ can join together to form a ring;

30 each Y is independently -O- or -S(O)₀₋₂-;

n is 0 to 4; and

each R present is independently selected from the group consisting of C₁₋₁₀ alkyl, C₁₋₁₀ alkoxy, hydroxy, halogen and trifluoromethyl; or a pharmaceutically acceptable salt thereof.

5 2. A compound or salt of claim 1 wherein the heteroaryl is selected from the group consisting of 2-pyridyl, 3-pyridyl, 4-pyridyl, 2-thiazolyl, and 4-pyrazolyl.

10 3. A compound or salt of claim 1 wherein X is -CH(alkyl)(alkyl)- wherein the alkyl groups can be the same or different.

15 4. A compound or salt of claim 1 wherein X is -CH₂-CH₂-.

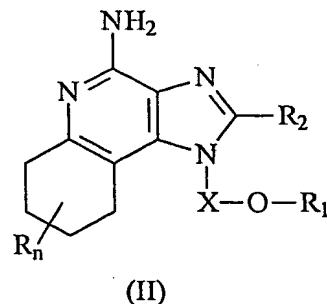
5. A compound or salt of claim 1 wherein X is -CH(C₂H₅)(CH₂)-.

15 6. A compound or salt of claim 1 wherein R₂ is H.

7. A compound or salt of claim 1 wherein R₂ is alkyl.

20 8. A compound or salt of claim 1 wherein R₂ is -alkyl-O-alkyl.

9. A compound of the formula (II)



25 wherein: X is -CHR₅-, -CHR₅-alkyl-, or -CHR₅-alkenyl-; R₁ is selected from the group consisting of:
-R₄-CR₃-Z-R₆-alkyl;

-R₄-CR₃-Z-R₆-alkenyl;
-R₄-CR₃-Z-R₆-aryl;
-R₄-CR₃-Z-R₆-heteroaryl;
-R₄-CR₃-Z-R₆-heterocyclyl;
5 -R₄-CR₃-Z-H;
-R₄-NR₇-CR₃-R₆-alkyl;
-R₄-NR₇-CR₃-R₆-alkenyl;
-R₄-NR₇-CR₃-R₆-aryl;
-R₄-NR₇-CR₃-R₆-heteroaryl;
10 -R₄-NR₇-CR₃-R₆-heterocyclyl; and
-R₄-NR₇-CR₃-R₈;
each Z is independently -NR₅-, -O-, or -S-;
R₂ is selected from the group consisting of:
-hydrogen;
15 -alkyl;
-alkenyl;
-aryl;
-heteroaryl;
-heterocyclyl;
20 -alkyl-Y-alkyl;
-alkyl-Y- alkenyl;
-alkyl-Y-aryl; and
- alkyl or alkenyl substituted by one or more substituents selected
from the group consisting of:
25 -OH;
-halogen;
-N(R₅)₂;
-CO-N(R₅)₂;
-CO-C₁₋₁₀ alkyl;
30 -CO-O-C₁₋₁₀ alkyl;
-N₃;
-aryl;

-heteroaryl;

-heterocyclyl;

-CO-aryl; and

-CO-heteroaryl;

5 each R_3 is =O or =S;

 each R_4 is independently alkyl or alkenyl, which may be interrupted by one or more -O- groups;

 each R_5 is independently H or C_{1-10} alkyl;

R_6 is a bond, alkyl, or alkenyl, which may be interrupted by one or more -O- groups;

10 R_7 is H, C_{1-10} alkyl, arylalkyl; or R_4 and R_7 can join together to form a ring;

R_8 is H or C_{1-10} alkyl; or R_7 and R_8 can join together to form a ring;

 each Y is independently -O- or -S(O)₀₋₂;

 n is 0 to 4; and

15 each R present is independently selected from the group consisting of C_{1-10} alkyl, C_{1-10} alkoxy, hydroxy, halogen, and trifluoromethyl;

 or a pharmaceutically acceptable salt thereof.

10. A compound or salt of claim 9 wherein R_2 is H or alkyl.

20 11. A compound or salt of claim 9 wherein R_2 is -alkyl-O-alkyl.

12. A pharmaceutical composition comprising a therapeutically effective amount of a compound or salt of claim 1 and a pharmaceutically acceptable carrier.

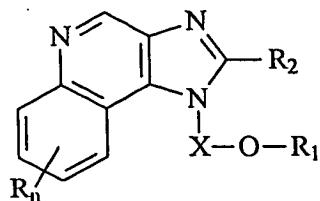
25 13. A method of inducing cytokine biosynthesis in an animal comprising administering a therapeutically effective amount of a compound or salt of claim 1 to the animal.

14. The method of claim 13 wherein the cytokine is IFN- α .

30 15. A method of treating a viral disease in an animal comprising administering a therapeutically effective amount of a compound or salt of claim 1 to the animal.

16. A method of treating a neoplastic disease in an animal comprising administering a therapeutically effective amount of a compound or salt of claim 1 to the animal.

5 17. A compound of the formula (III):



(III)

wherein: X is -CHR₅-, -CHR₅-alkyl-, or -CHR₅-alkenyl-;

10 R₁ is selected from the group consisting of:

-R₄-CR₃-Z-R₆-alkyl;
-R₄-CR₃-Z-R₆-alkenyl;
-R₄-CR₃-Z-R₆-aryl;

-R₄-CR₃-Z-R₆-heteroaryl;

-R₄-CR₃-Z-R₆-heterocyclyl;

-R₄-CR₃-Z-H;

-R₄-NR₇-CR₃-R₆-alkyl;

-R₄-NR₇-CR₃-R₆-alkenyl;

-R₄-NR₇-CR₃-R₆-aryl;

-R₄-NR₇-CR₃-R₆-heteroaryl;

20 -R₄-NR₇-CR₃-R₆-heterocyclyl; and -R₄-NR₇-

CR₃-R₈;

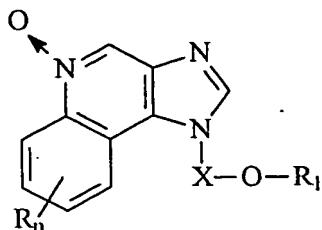
each Z is independently -NR₅-, -O-, or -S-;

R₂ is selected from the group consisting of:

25 -hydrogen;
-alkyl;
-alkenyl;
-aryl;

-heteroaryl;
-heterocycll;
-alkyl-Y-alkyl;
-alkyl-Y- alkenyl;
-alkyl-Y-aryl; and
5 - alkyl or alkenyl substituted by one or more substituents selected
from the group consisting of:
-OH;
-halogen;
10 -N(R₅)₂;
-CO-N(R₅)₂;
-CO-C₁₋₁₀ alkyl;
-CO-O-C₁₋₁₀ alkyl;
-N₃;
15 -aryl;
-heteroaryl;
-heterocycll;
-CO-aryl; and
-CO-heteroaryl;
20 each R₃ is =O or =S;
each R₄ is independently alkyl or alkenyl, which may be interrupted by one
or more -O- groups;
each R₅ is independently H or C₁₋₁₀ alkyl;
R₆ is a bond, or is alkyl, or alkenyl, which may be interrupted by one or
25 more -O- groups;
R₇ is H, C₁₋₁₀ alkyl, or arylalkyl; or R₄ and R₇ can join to form a ring;
R₈ is H or C₁₋₁₀ alkyl; or R₇ and R₈ can join to form a
each Y is independently -O- or -S(O)₀₋₂;
n is 0 to 4; and
30 each R present is independently selected from the group consisting of C₁₋₁₀
alkyl, C₁₋₁₀ alkoxy, hydroxy, halogen and trifluoromethyl;
or a pharmaceutically acceptable salt thereof.

18. A compound of the formula (IV):



(IV)

5

wherein X is $-\text{CHR}_5-$, $-\text{CHR}_5\text{-alkyl}-$, or $-\text{CHR}_5\text{-alkenyl}-$;

10

\mathbf{R}_1 is selected from the group consisting of:

$-\text{R}_4\text{-CR}_3\text{-Q-R}_6\text{-alkyl};$

$-\text{R}_4\text{-CR}_3\text{-Q-R}_6\text{-alkenyl};$

$-\text{R}_4\text{-CR}_3\text{-Q-R}_6\text{-aryl};$

$-\text{R}_4\text{-CR}_3\text{-Q-R}_6\text{-heteroaryl};$

$-\text{R}_4\text{-CR}_3\text{-Q-R}_6\text{-heterocyclyl};$

$-\text{R}_4\text{-CR}_3\text{-Q-H};$

$-\text{R}_4\text{-NR}_5\text{-CR}_3\text{-R}_6\text{-alkyl};$

15

$-\text{R}_4\text{-NR}_5\text{-CR}_3\text{-R}_6\text{-alkenyl};$

$-\text{R}_4\text{-NR}_7\text{-CR}_3\text{-R}_6\text{-aryl};$

$-\text{R}_4\text{-NR}_7\text{-CR}_3\text{-R}_6\text{-heteroaryl};$

$-\text{R}_4\text{-NR}_7\text{-CR}_3\text{-R}_6\text{-heterocyclyl};$ and

$-\text{R}_4\text{-NR}_7\text{-CR}_3\text{-R}_8;$

20

each \mathbf{Q} is independently $-\text{NR}_5-$ or $-\text{O}-$;

each \mathbf{R}_3 is $=\text{O}$ or $=\text{S}$;

each \mathbf{R}_4 is independently alkyl or alkenyl, which may be interrupted by one or more $-\text{O}-$ groups;

each \mathbf{R}_5 is independently H or C_{1-10} alkyl;

25

\mathbf{R}_6 is a bond, alkyl, or alkenyl, which may be interrupted by one or more $-\text{O}-$ groups;

\mathbf{R}_7 is H, C_{1-10} alkyl, or arylalkyl; or \mathbf{R}_4 and \mathbf{R}_7 can join to form a ring;

\mathbf{R}_8 is H or C_{1-10} alkyl; or \mathbf{R}_7 and \mathbf{R}_8 can join to form a ring;

n is 0 to 4; and

each R present is independently selected from the group consisting of C₁₋₁₀ alkyl, C₁₋₁₀ alkoxy, halogen and trifluoromethyl; or a pharmaceutically acceptable salt thereof.

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19. A pharmaceutical composition comprising a therapeutically effective amount of a compound or salt of claim 9 and a pharmaceutically acceptable carrier.

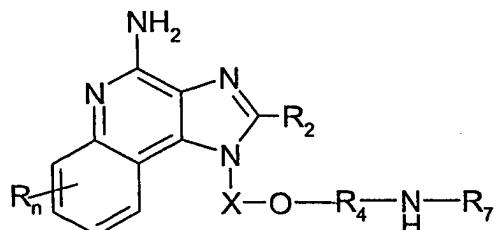
20. A method of inducing cytokine biosynthesis in an animal comprising administering
10 a therapeutically effective amount of a compound or salt of claim 9 to the animal. .

21. The method of claim 20 wherein the cytokine is IFN- α .

22. A method of treating a viral disease in an animal comprising administering a
15 therapeutically effective amount of a compound or salt of claim 9 to the animal.

23. A method of treating a neoplastic disease in an animal comprising administering a therapeutically effective amount of a compound or salt of claim 9 to the animal.

20 24. A compound of the formula (V):



(V)

25 wherein: X is $-\text{CHR}_5-$, $-\text{CHR}_5\text{-alkyl-}$, or $-\text{CHR}_5\text{-alkenyl-}$;

R₂ is selected from the group consisting of:

-hydrogen;
-alkyl;

-alkenyl;
-aryl;
-heteroaryl;
-heterocyclyl;
5 -alkyl-Y-alkyl;
-alkyl-Y- alkenyl;
-alkyl-Y-aryl; and
- alkyl or alkenyl substituted by one or more substituents selected
from the group consisting of:

10 -OH;
-halogen;
-N(R₅)₂;
-CO-N(R₅)₂;
-CO-C₁₋₁₀ alkyl;
-CO-O-C₁₋₁₀ alkyl;
15 -N₃;
-aryl;
-heteroaryl;
-heterocyclyl;
20 -CO-aryl; and
-CO-heteroaryl;

each R₄ is independently alkyl or alkenyl, which may be interrupted by one
or more -O- groups;
R₇ is H, C₁₋₁₀ alkyl, or arylalkyl; or R₄ and R₇ can join to form a ring;
25 each Y is independently -O- or -S(O)₀₋₂-;
n is 0 to 4; and
each R present is independently selected from the group consisting of C₁₋₁₀
alkyl, C₁₋₁₀ alkoxy, hydroxy, halogen and trifluoromethyl;
or a pharmaceutically acceptable salt thereof.

30